

NON-PUBLIC?: N
ACCESSION #: 8910180019
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Surry Power Station, Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000281

TITLE: Turbine Trip/Reactor Trip Due to 86 BU Trip Caused By Spurious Actuation of KD-41 Relay
EVENT DATE: 09/18/89 LER #: 89-009-00 REPORT DATE: 10/13/89

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 014

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: M. R. Kansler, Station Manager TELEPHONE: 804-357-3184

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: TB COMPONENT: RLY MANUFACTURER: W120
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED:

ABSTRACT:

On September 18, 1989, at 1042 hours, with Unit 2 reactor at 14% power and the turbine at 1800 rpm under no load conditions, a reactor trip signal was generated. A generator backup differential lockout relay 86 BU tripped the turbine, and since reactor power was greater than 10%, the turbine trip initiated a reactor trip. Operators performed the appropriate plant procedures and quickly stabilized the plant following the trip. The 86 BU generator backup lockout relay trip was caused by the spurious actuation of the generator backup impedance relay (KD-41). The exact cause of the spurious actuation of the relay could not be determined, however faults were discovered in the relay. The faulted KD-41 relay was replaced and appropriate testing was performed. The generator startup procedure has been revised to ensure that reactor power is less than 10% prior to closing the exciter field breaker. A four hour non-emergency report was made to the Nuclear Regulatory Commission in accordance with 10CFR50.72.

END OF ABSTRACT

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1.0 Description of the Event

On September 18, 1989, Unit 2 was being placed on-line following an extended maintenance outage. At 1042 hours, with Unit 2 reactor at 14% power and the turbine (EIIS-TRB) at 1800 rpm under no load conditions, a reactor trip signal was generated. Prior to the trip, the Unit 2 licensed control room operator (CRO) was preparing to synchronize the generator (EIIS-GEN) with the grid in accordance with an approved operating procedure, 2-OP-2.2.1 "Turbine Generator Startup to 20%." The licensed CRO had closed the generator exciter field breaker (EIIS-BKR) and was attempting to adjust generator voltage when a generator backup differential lockout relay (EIIS-RLY) (86 BU) trip occurred. The 86 BU lockout tripped the turbine, and since reactor power was greater than 10%, the turbine trip initiated a reactor trip.

Following the trip, plant safety systems functioned as designed except that a greater than expected Reactor Coolant System (RCS) (EIIS-AB) cooldown was noted. A temperature of 530 degrees Fahrenheit was noted shortly after the trip versus the expected 547 degrees Fahrenheit. In addition, the turbine turning gear oil pump (EIIS-P) did not automatically start as required. However, the emergency backup oil pump automatically started to provide adequate oil pressure.

A four hour non-emergency report was made to the Nuclear Regulatory Commission per 10CFR50.72.

2.0 Safety Consequences and Implications

During this event, the turbine protection and reactor protection systems functioned as designed. In addition, plant safety systems remained operable and plant parameters remained well within the bounds of the accident analysis. Therefore, the health and safety of the public were not affected.

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3.0 Cause

The 86 BU generator backup lockout relay trip was caused by the

spurious actuation of the generator backup impedance relay (KD-41). Subsequent testing of the KD-41 relay determined that two faults existed in the relay circuit, a circuit ground and a circuit short due to two resistors making contact. It was also noted that a fuse in the generator metering and relaying potential transformer circuit was open. Although it was not determined which of the conditions above caused the relay to actuate, a combination of the existing KD-41 relay faults and the open fuse may have actuated the KD-41 relay. The open fuse by itself also had the potential to actuate the KD-41 relay.

The turning gear oil pump did not automatically start because the oil pressure switch that actuates the turning gear oil pump was improperly set.

4.0 Immediate Corrective Action(s)

Operators followed appropriate plant procedures to quickly stabilize the unit following the reactor trip. Also, the Shift Technical Advisor performed the critical safety function status tree review to ensure specific plant parameters were noted and that those parameters remained within safe bounds.

5.0 Additional Corrective Action(s)

The faulty KD-41 relay and the open fuse were replaced. The KD-41 relay was tested to determine the failure mode and the generator metering circuit was tested to ensure proper operation after fuse replacement.

Additionally, the maintenance procedures for the turbine generator were reviewed to ensure that the faulty conditions which existed were not a result of improper maintenance. These procedures were determined to be satisfactory.

The turning gear bearing oil pressure switch setpoint was adjusted to its proper value.

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6.0 Action(s) Taken to Prevent Recurrence

The generator startup procedure has been revised for both units to ensure that reactor power is less than 10% prior to closing the exciter field breaker. This revision will preclude a reactor trip if, at the time the field breaker is closed, a fault exists on the

generator that results in a generator/turbine trip.

7.0 Similar Events

Westinghouse/KD-41, 293B288A14.

8.0 Manufacturer/Model Number(s)

None.

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VIRGINIA ELECTRIC AND POWER COMPANY

Surry Power Station

P.O. Box 315

Surry, Virginia 23883

October 13, 1989

U. S. Nuclear Regulatory Commission Serial No.: 89-044

Document Control Desk Docket Nos.: 50-281

Washington, D.C. 20555 License Nos.: DPR-37

Gentlemen:

Pursuant to Surry Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report for Unit 2.

REPORT NUMBER

89-009-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be reviewed by Safety Evaluation and Control.

Very truly yours,

M. R. Kansler
Station Manager

Enclosure

cc: Regional Administrator
Suite 2900
101 Marietta Street, NW

Atlanta, Georgia 30323

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